Journal of the IEST

VOLUME XLV 2002 (ISSN 1098-4321)
The official publication of the Institute of Environmental Sciences and Technology

TECHNICAL ARTICLES

The technical articles included in this annual issue of the *Journal of the IEST* include many papers reprinted from the *ESTECH 2001 Proceedings* or presented at ESTECH 2001 in Phoenix, Arizona. The ESTECH 2001 selections were chosen by the Technical Vice President of each division: Jan Eudy, Technical Vice President, Contamination Control, and Stanley Poynor, Technical Vice President, Design, Test, and Evaluation/Product Reliability.

Contamination Control

37 **A Review of Analytical Techniques for Identifying Contaminants in the Semiconductor Industry**
Victor K. F. Chia

45 **Internet Data Centers and the Infrastructure Require Environmental Design, Controls, and Monitoring**
Clifford F. Frith

53 **Codes and Standards Resource for Semiconductor Fabrication Facilities**
Jason D. Hailer and Allan D. Chasey

61 **Benchmarking Time and Cost of Semiconductor Fabrication Facilities**
Min He, Allan D. Chasey, and Sachin Patel

65 **Evaluating the Effectiveness of AMC Control Strategies with Reactivity Monitoring**
Chris Muller

81 **Measurement of Electrical Properties of Cleanroom Gloves**
Carl E. Newberg

93 **How Clean Is It? The Use of Ion Chromatography to Monitor Contamination in Cleanroom Environments**
Beverly J. Newton

98 **Ozone Production by Corona Discharges**
Charles G. Noll

Journal of the IEST

VOLUME XLV 2002 (ISSN 1098-4321)
The official publication of the Institute of Environmental Sciences and Technology

TECHNICAL ARTICLES

The technical articles included in this annual issue of the *Journal of the IEST* include many papers reprinted from the *ESTECH 2001 Proceedings* or presented at ESTECH 2001 in Phoenix, Arizona. The ESTECH 2001 selections were chosen by the Technical Vice President of each division: Jan Eudy, Technical Vice President, Contamination Control, and Stanley Poynor, Technical Vice President, Design, Test, and Evaluation/Product Reliability.

Contamination Control

37 **A Review of Analytical Techniques for Identifying Contaminants in the Semiconductor Industry**
Victor K. F. Chia

45 **Internet Data Centers and the Infrastructure Require Environmental Design, Controls, and Monitoring**
Clifford F. Frith

53 **Codes and Standards Resource for Semiconductor Fabrication Facilities**
Jason D. Hailer and Allan D. Chasey

61 **Benchmarking Time and Cost of Semiconductor Fabrication Facilities**
Min He, Allan D. Chasey, and Sachin Patel

65 **Evaluating the Effectiveness of AMC Control Strategies with Reactivity Monitoring**
Chris Muller

81 **Measurement of Electrical Properties of Cleanroom Gloves**
Carl E. Newberg

93 **How Clean Is It? The Use of Ion Chromatography to Monitor Contamination in Cleanroom Environments**
Beverly J. Newton

98 **Ozone Production by Corona Discharges**
Charles G. Noll

106 **The Effects of Ambient Differential Pressure on Minienvironments, Isolation Enclosures, and Laminar Flow Devices**
John Walters

Design, Test, and Evaluation/Product Reliability

113 **End-to-End Mechanical Calibration of Strain Channels in Dynamic Health Monitoring Systems**
David Banaszak

121 **Certification of 200,000 g Shock Calibration Technique for Sensors**
Vesta I. Bateman and Philip D. Thacher

129 **Structural Response Loads in Force-Limited Vibration Testing**
Kurng Y. Chang

136 **An Integrated Acoustic Analysis Capability**
Y. Albert Lee and Jason Tolomeo

144 **Force Limits Measured on a Space Shuttle Flight**
Terry D. Scharton

149 **Planning Climatic Tests Using Physics-of-Failure Principles and Empirical Models**
Z. Sherf and P. Hopstone

161 **Problems in the Analysis of a Shock Sequence with Application to Gunfire Analysis and Simulation**
Z. Sherf, P. Hopstone, G. Ostrovski, R. Klein, and D. Ben Yehuda

178 **A Family of Transients Suitable for Reproduction on a Shaker Based on the $\cos^m(x)$ Window**
David O. Smallwood

IEST Mission Statement

THE INSTITUTE OF ENVIRONMENTAL SCIENCES AND TECHNOLOGY

is an international professional society that serves members and the industries they represent through education and the development of recommended practices and standards.

Web Watch

24/7/365

The publications featured in the *IEST Professional Resources 2002* catalog can be ordered from the IEST website 24 hours a day, 7 days a week, year 'round. Be sure to log in through our Members Only area to receive your IEST member discount. The entire catalog is also available for easy downloading and viewing from the website.

Coming in Fall 2002... the *ESTECH 2003 Advance Program*

Watch your e-mail and the IEST website for the *ESTECH 2003 Advance Program*. A downloadable and printable PDF file will be available online.

Don't forget—

Visit IEST online to find news and information on all things IEST—upcoming meetings, ISO documents, chapter activities, sponsorship opportunities, membership benefits, Working Groups, Recommended Practices, and more!

www.iest.org

DEPARTMENTS

5 **President's Message**

5 **Executive Board**

10 ***Journal of the IEST* Staff**

12 **Future Meetings**

15, 21, 187 **IEST Publications**

28 **IEST Corporate Sponsors**

33 **IEST Chapter Presidents and National Directors**

186 **Advertisers Index**

NEWS AND FEATURES

2 **ESTECH 2003**

3 **IEST 50th Anniversary/Yearbook Information**

4 **Space Simulation Conference**

12 **IEST Headquarters Has Moved**

18 **IEST Fall Conference 2002**

20 **2002-2003 Membership Campaign**

23 **Reliability and Maintainability Symposium (RAMS)**

25 **Call for Award Nominations**

27 **Call for Executive Board Nominations**

30 **Aerospace Testing Seminar**

35 ***Journal of the IEST:* Call for Reviewers**

36 ***Journal of the IEST:* Call to Publish**

186 **ISO/DIS 14644-3 Now Available**

187 **ESTECH 2004**